Available online at www.sciencedirect.com

SciVerse ScienceDirect

British Journal of Oral and Maxillofacial Surgery 53 (2015) 826–830

BRITISH Journal of Oral and Maxillofacial Surgery
www.bjoms.com

Effectiveness of 0.2% chlorhexidine gel and a eugenol-based paste on postoperative alveolar osteitis in patients having third molars extracted: a randomised controlled clinical trial

James Solomon Jesudasan *, P.U. Abdul Wahab, M.R. Muthu Sekhar

Saveetha Dental College, Department Oral & Maxillofacial Surgery, 162 Poonammallee High Road, Chennai 600077, India

Accepted 21 June 2015
Available online 16 July 2015

Abstract

The aim of this study was to compare the effect of application of 0.2% chlorhexidine gel, a eugenol-based paste, together with a control group on the postoperative incidence of alveolar osteitis in patients having third molars extracted. A total of 270 patients who had this procedure at the Dept of Oral and Maxillofacial Surgery, Saveetha Dental College and who met the inclusion criteria were enrolled in the study and divided into 3 groups: the first had a 0.2% chlorhexidine-based gel applied to the alveolar socket once after extraction; the second had a eugenol-based paste applied to the alveolar socket once after extraction; and the third group acted as controls, with no treatment. The incidence of alveolar osteitis was recorded for 7 days. We also recorded postoperative pain, inflammation, infection, and wound healing. Nine of the control group (10%) and 2 (2%) of the chlorhexidine group developed alveolar osteitis on the seventh postoperative day. The overall incidence (11/270) was 4%, which is less than reported elsewhere. The distribution of alveolar osteitis among the 3 groups was significant (p= 0.002), with the eugenol group having no cases. The chlorhexidine group showed less incidence of alveolar osteitis than other reported studies and also less pain, inflammation, infection, and better wound healing than the control group. We conclude that eugenol was the better of the 2 interventions.

Keywords: Alveolar osteitis; Prevention of alveolar osteitis; Dry socket; Intra-alveolar medication

Introduction

One of the most common postoperative complications after the extraction of permanent teeth is a condition known as dry socket. This term has been in use since 1896, when it was first described by Crawford.[1] Since then several other terms have been used, including alveolar osteitis, localised osteitis, postoperative alveolitis, alveolalgia, alveolitis, sicca dolorosa, and fibrinolytic alveolitis.

Birn[2] labelled the complication fibrinolytic alveolitis, which is the most accurate of the terms, but also the least used. The condition has generally been characterised by delayed healing associated with degradation of clot, and is usually accompanied by persistent, radiating, pain postoperatively in and around the extraction site that is not easily relieved by analgesics.

It can be a burden for both patients and surgeons,[3] and may result in a loss of productivity because at least 45% of patients require multiple visits to the surgeon. It can also be costly in terms of the clinic time required to manage the patient's symptoms.[4,5]

* Corresponding author at: 162 Poonammallee High Road Department Oral & Maxillofacial Surgery Saveetha Dental College. Chennai.600077. India. Tel.: +044-26801581-4.

E-mail addresses: jamesjesudasan@yahoo.co.in (J.S. Jesudasan), docwahab@hotmail.com (P.U.A. Wahab), mrmsekar@yahoo.com (M.R.M. Sekhar).

http://dx.doi.org/10.1016/j.bjoms.2015.06.022

Rationale for this trial

Many authors have advocated different methods of treating alveolar osteitis, some of whom have promoted dressings that contain eugenol to prevent its development,[6–8] and some who have shown that that the use of 0.12% chlorhexidine before and after extraction decreases its incidence after removal of mandibular third molars.[8–11] Despite many years of research, however, little progress has been made and so a study with a large enough sample and standard outcome measures is warranted.

Patients and methods

Design of the study

We selected a power of 90% and a probability of less than 0.05 to be significant. We calculated the sample size using G power software and concluded that a final minimum sample size of 90 patients in each group would be satisfactory.

This double blind, randomised, controlled trial was done between January 2012 and September 2013 after review and ethical clearance by the institutional ethics committee. Informed consent was obtained from all the participants. Patients with clinical and radiographic evidence of impacted mandibular third molars were included.

Patients with any systemic disease, history of epilepsy, smokers, those who misused alcohol, women taking contraceptives, patients with infections or who were taking analgesics 1 week preoperatively, those known to be allergic to chlorhexidine or eugenol, and any other condition or disease that contraindicated extraction were excluded.

The 270 patients were divided into 3 equal groups of 90 each by block randomisation. Lots were picked to decide the allocation of the patients.

Operative technique

Local anaesthetic comprised 1% or 2% lignocaine hydrochloride 2 ml with 1:200,000 units adrenalin. Bone guttering was done as and when necessary with the aid of a saline-cooled bur. The tooth was raised, extracted in full, or split as and when necessary according to the habit of the operating surgeon, and 0.2% chlorhexidine gel, or Alvogel, or nothing placed in the extraction socket. The socket was then sutured.

Patients were discharged taking metronidazole 400 mg three times daily for 3 days and Zerodol (aceclophenac + serratiopeptidase, Intas Pharm, Ahmedabad, India) twice daily for 3 days, and were reviewed on postoperative days 1, 3, and 7.

Criteria for diagnosis and collection of data

For the diagnosis of alveolar osteitis, 2 of 3 criteria must be met.[12] These are: increased throbbing pain between postoperative days 3 and 5 that is not relieved by analgesics; the presence of dark fragments from a resorbed blood clot on irrigation of a painful extraction socket; and substantial alleviation of pain with a reduction on the visual analogue scale (VAS for pain 1-10) of more than 3 points within 10 minutes of application of a dressing to the dry socket. Infection and epithelialisation were measured as described by Aronovich et al.[12]

Analysis of data

The significances of differences among the data were evaluated with the help of SPSS (version17, SPSS Inc, Chicago, IL, USA). One way analysis of variance (ANOVA) was used for mean pain values, the chi square test for the incidence of alveolar osteitis, and the repeated measures ANOVA was used for pain.

Results

We studied a total of 270 patients (160 male and 110 female). The mean (SD) age in the control group was 28 (7) years, in the chlorhexidine group 28 (6) years, and in the eugenol group 29 (8) years. The mean ages did not differ significantly (p=0.392), nor did the level, class, or angulation of the tooth.

Wound healing was poorest in the control group on day 7 with a mean score of 2.51 compared to 1.69 and 1.32 in the chlorhexidine and eugenol groups (p<0.001, Table 1).

Eleven of the 270 patients (4%) developed alveolar osteitis on postoperative day 7 (Table 2) and its distribution among the 3 groups was significant(p< 0.002) with there being none in the eugenol group. The incidence of infection followed a similar pattern to that of osteitis and was less than that reported in other papers.

Postoperative pain was worst in the control group, with the highest mean (SD) VAS score on day 1 (Tables 1 and 3). Day 3 showed a mean VAS score of only 1.62 in the eugenol group as compared to 3.33 and 5.4 in the chlorhexidine and control groups. This continued to be the pattern on day 7 groups (p <0.001).

Inflammation on day 1 did not differ significantly, but on days 3 and 7 there were significant differences among the 3 groups (p<0.001, Table 4). Table 5 shows the within-subjects and between-subjects effects of the analysis of pain scores.

Discussion

Most patients are not aware of the complications of surgical extraction of wisdom teeth, which prompted us to organise a study to try and solve the problem of alveolar osteitis. We wanted to provide a reasonably cheap and efficient method that could be universally used to avoid it.